



US005928283A

**United States Patent** [19]

Gross et al.

[11] **Patent Number:** 5,928,283[45] **Date of Patent:** Jul. 27, 1999[54] **TELESCOPIC DEVICE FOR AN  
INTRAOCULAR LENS**[75] **Inventors:** Yosef Gross, Moshav Mazor; Isaac  
Lipshitz, Herzelia Pituach; Dotan  
Gedeon, Yehud, all of Israel[73] **Assignee:** Visioncare Ltd, Yehud, Israel[21] **Appl. No.:** 08/882,972[22] **Filed:** Jun. 26, 1997[51] **Int. Cl.<sup>6</sup>** ..... A61F 2/16[52] **U.S. Cl.** ..... 623/6[58] **Field of Search** ..... 623/6[56] **References Cited****U.S. PATENT DOCUMENTS**

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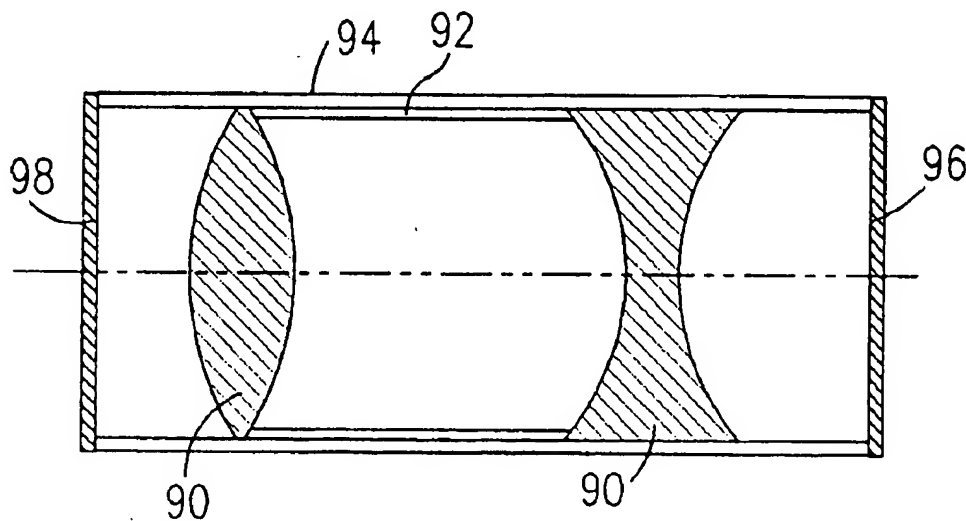
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*Attorney, Agent, or Firm*—Darby & Darby

[57] **ABSTRACT**

An intraocular lens implant for implantation in the interior of a human eye comprising a telescope body having an anterior end and a posterior end and including at least one window sealed to the telescope body at at least one of the anterior end and the posterior end and at least two lenses disposed within the telescope body intermediate the anterior end and the posterior end.

**14 Claims, 4 Drawing Sheets**

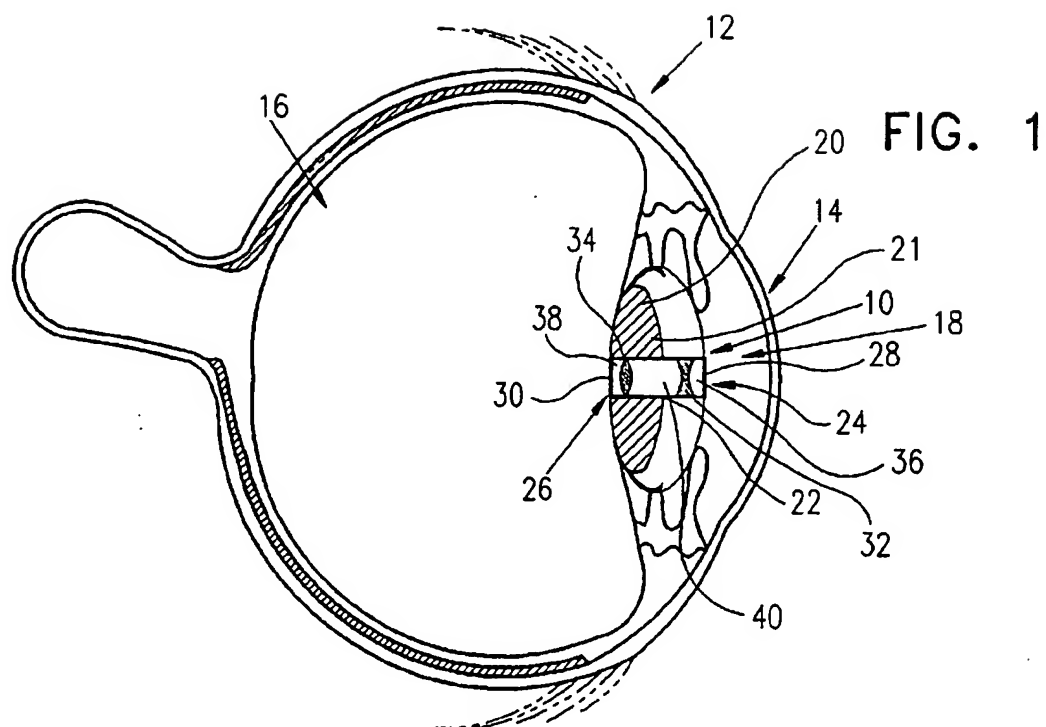


FIG. 2

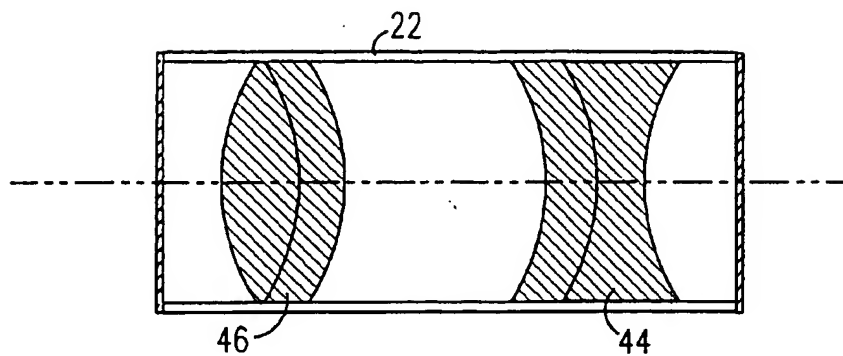


FIG. 3

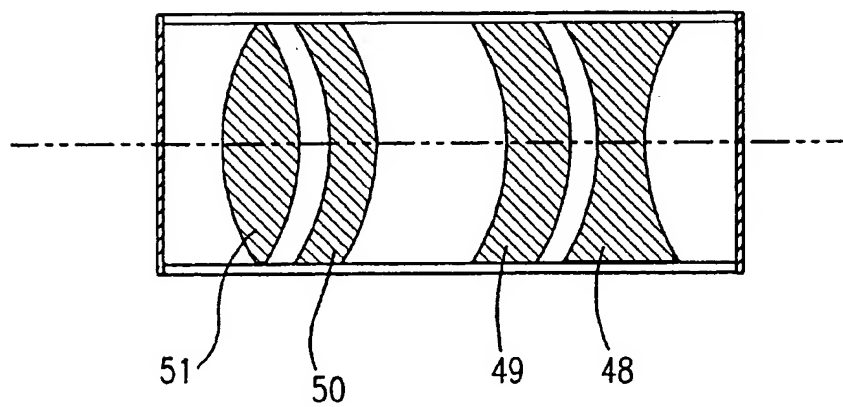
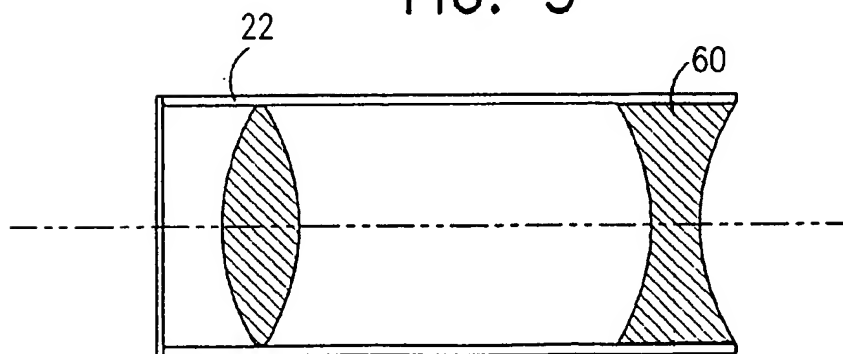


FIG. 5



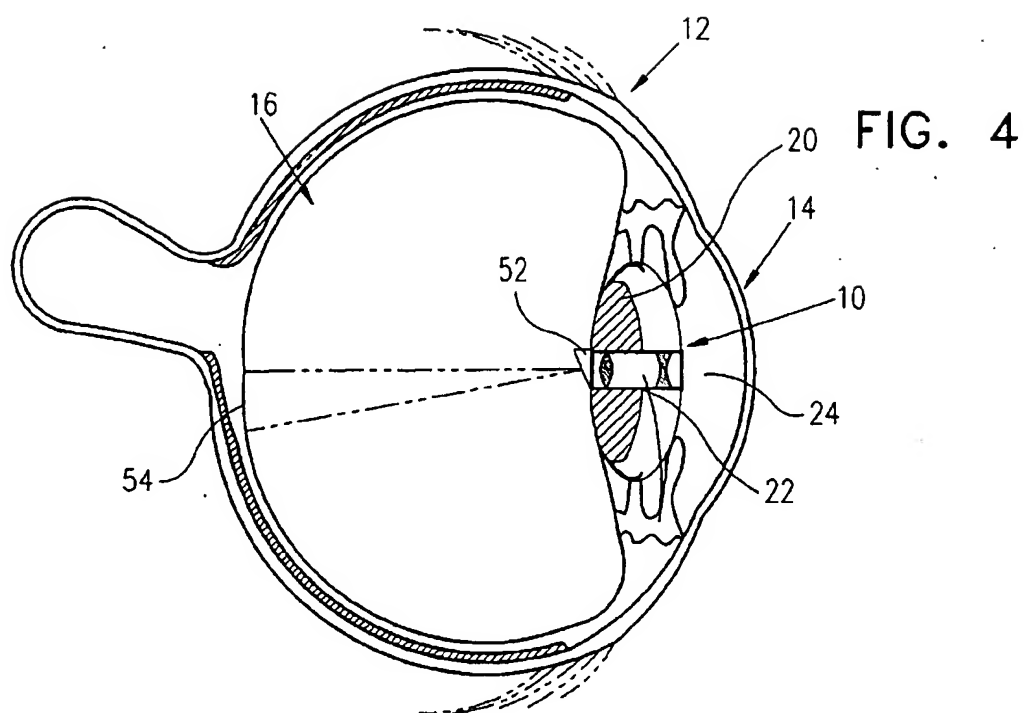


FIG. 6

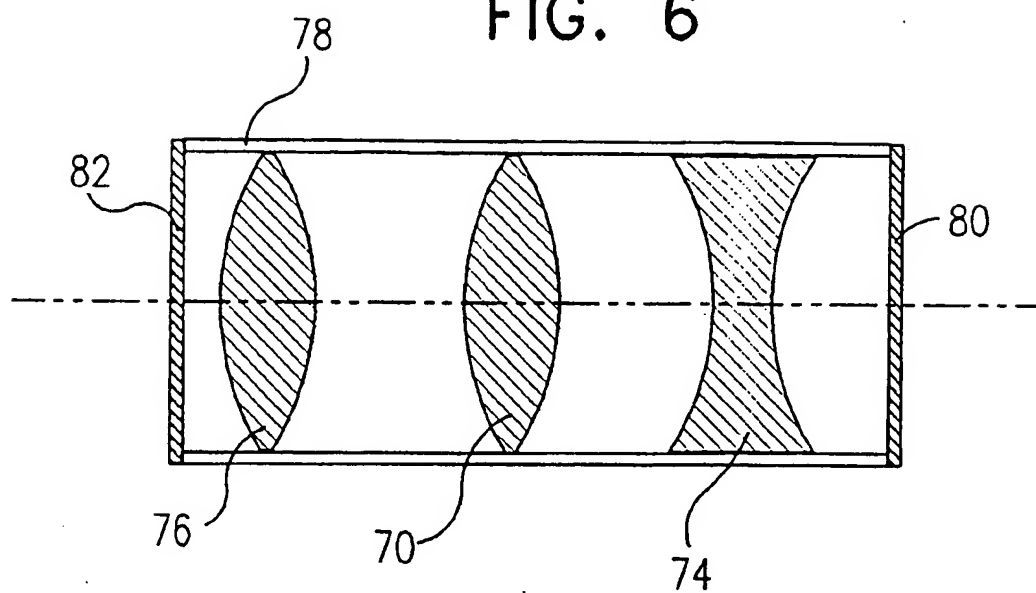
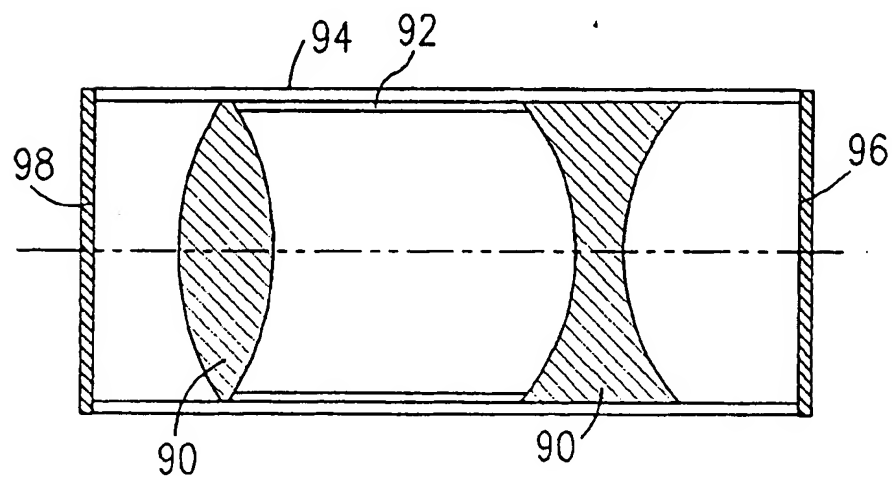


FIG. 7



1

## TELESCOPIC DEVICE FOR AN INTRAOCULAR LENS

### FIELD OF THE INVENTION

The present invention relates to intraocular lens implants generally.

### BACKGROUND OF THE INVENTION

Various types of intraocular lens implants are known in the patent literature. Particular reference is made to U.S. Pat. Nos. 5,391,202 and 5,354,335 of the present applicant/assignee and to the references cited therein. Other relevant references include European Published Patent Application EP-A-212616, U.S. Pat. Nos. 4,074,368; 4,172,297; 4,759,761 and 5,275,623 and French Published Patent Application 2,666,735.

The utility of intraocular lens implants is described in the above patent references. The disclosures of the above-mentioned publications are hereby incorporated by reference.

### SUMMARY OF THE INVENTION

The present invention seeks to provide improved intraocular lens implants.

There is thus provided in accordance with a preferred embodiment of the present invention an intraocular implant for implantation in the interior of a human eye comprising a telescope body having an anterior end and a posterior end and including at least one window sealed to the telescope body at at least one of the anterior end and said posterior end and at least two lenses disposed within the telescope body intermediate the anterior end and said posterior end.

In accordance with a preferred embodiment of the present invention, the lenses are doublet lenses.

Preferably, the windows are generally without optical power.

In accordance with a preferred embodiment of the present invention air gaps are defined between the lenses and between the lenses and the windows.

In accordance with a preferred embodiment of the invention, one of the windows may define a prism.

In accordance with an alternative embodiment of the present invention, the lenses may be joined together by a cylindrical member disposed within the telescope body.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

FIG. 1 is a simplified pictorial illustration of an intraocular insert constructed and operative in accordance with a preferred embodiment of the present invention located within a human eye;

FIG. 2 is a simplified pictorial illustration of an intraocular insert of the general type shown in FIG. 1, but including joined doublet lenses;

FIG. 3 is a simplified pictorial illustration of an intraocular insert of the general type shown in FIG. 2, but including separated doublet lenses;

FIG. 4 is a simplified pictorial illustration of an intraocular insert, located within a human eye, of the general type shown in FIG. 1, wherein one of the windows comprises a prism;

2

FIG. 5 is a simplified pictorial illustration of an intraocular insert of the general type shown in FIG. 1, but having only one window;

FIG. 6 is a simplified pictorial illustration of an intraocular insert of the general type shown in FIG. 1, but including more than two lenses; and

FIG. 7 is a simplified pictorial illustration of an intraocular insert of the general type shown in FIG. 1, wherein a telescope is encapsulated within an outer housing having windows.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to FIG. 1, which is a simplified pictorial illustration of an intraocular insert constructed and operative in accordance with a preferred embodiment of the present invention located within a human eye.

As seen in FIG. 1, there is provided an intraocular lens implant, indicated generally by reference numeral 10, which is implanted in the interior of a human eye 12. In the illustrated embodiment, the implant comprises a telescope 18 which preferably extends through at least a portion of a lens capsule 20 of the eye 12. The telescope 18 may extend forwardly of the lens capsule 20 toward the anterior side 14 of the eye. Alternatively it may extend posteriorly of the lens capsule or both.

In accordance with a preferred embodiment of the present invention, the telescope 18 is mounted on a carrying lens 21. Alternatively, the telescope 18 may be mounted in the lens capsule by loops or any other suitable apparatus.

In the illustrated embodiment of FIG. 1, it is seen that the telescope comprises a telescope body 22, typically of circular cylindrical configuration and formed of glass or other suitable non-porous bio-compatible material or other material which is coated with a suitable non-porous bio-compatible material.

Sealed to anterior and posterior ends 24 and 26 of the telescope body 22 are respective windows 28 and 30 which preferably do not have optical power. Mounted onto telescope body 22 intermediate windows 28 and 30 there are provided forward and rearward lenses, 32 and 34. Preferably air gaps 36 and 38 are defined between lenses 32 and 34 and respective windows 28 and 30 and an air gap 40 is defined between lenses 32 and 34.

According to an alternative embodiment of the present invention, illustrated in FIG. 2, joined doublet lenses 44 and 46 may be employed to avoid chromatic aberrations.

According to a further alternative embodiment of the present invention, illustrated in FIG. 3, joined doublet lenses 48 and 49 and 50 and 51 may be employed. The configuration of FIG. 3 may be used to provide enhanced optical power.

According to another alternative embodiment of the invention, illustrated in FIG. 4, one of the windows may be in the form of a prism 52, thereby to direct light passing therethrough off-axis onto a portion 54 of the retina which lies alongside portions of the retina which may have been rendered inoperative by disease.

According to further alternative embodiments of the present invention, illustrated in FIG. 5, one of the windows may be eliminated and one of lenses, here indicated by reference numerals 60, also serves as a window.

According to yet another alternative embodiment of the present invention illustrated in FIG. 6, an additional lens 70 may be provided spaced from forward and rearward lenses

3

74 and 76 respectively along a telescope body 78 between windows 80 and 82.

According to yet another alternative embodiment of the present invention illustrated in FIG. 7, a plurality of lenses 90 may be joined together by a cylindrical member 92 disposed within a telescope body 94 intermediate windows 96 and 98.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and sub-combinations of the various features described hereinabove as well as variations and further developments thereof which would occur to persons skilled in the art upon reading the above description and which are not in the prior art.

We claim:

1. An intraocular lens implant for implantation in the interior of a human eye comprising a telescope body having an anterior end and a posterior end and including at least one window sealed to the telescope body at at least one of the anterior end and said posterior end and at least two lenses disposed within the telescope body intermediate the anterior end and the posterior end, wherein said at least two lenses are joined together by a cylindrical member disposed within the telescope body.

2. An intraocular lens implant according to claim 1 and wherein at least one of said at least two lenses are doublet lenses.

3. An intraocular lens implant according to claim 2 and wherein said at least one window is generally without optical power.

4

4. An intraocular lens implant according to claim 2 and wherein air gaps are defined between the lenses and between the lenses and said at least one window.

5. An intraocular lens implant according to claim 2 and wherein at least one window defines a prism.

6. An intraocular lens implant according to claim 2 and wherein said doublet lenses are joined doublet lens.

7. An intraocular lens implant according to claim 2 and wherein said doublet lenses are separated doublet lens.

8. An intraocular lens implant according to claim 1 and wherein said at least one window is generally without optical power.

9. An intraocular lens implant according to claim 8 and wherein air gaps are defined between the lenses and between the lenses and said at least one window.

10. An intraocular lens implant according to claim 8 and wherein at least one window defines a prism.

11. An intraocular lens implant according to claim 1 and wherein air gaps are defined between the lenses and between the lenses and said at least one window.

12. An intraocular lens implant according to claim 11 and wherein at least one window defines a prism.

13. An intraocular lens implant according to claim 1 and wherein at least one window defines a prism.

14. An intraocular lens implant according to claim 1 and wherein one of said lenses is a positive lens disposed towards said posterior end and another of said lenses is a negative lens disposed towards said anterior end.

\* \* \* \* \*

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3	US 20040015236	U	20040122	8	Sarfarazi e
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11	US 6596026 B1	U	20030722	7	Telescopic
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13	US 20030109925	U	20030612	10	Accommodati
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24	US 6464725 B2	U	20021015	12	Two-lens ad
25	US 20020143395	U	20021003	11	Two-lens ad
26	US 6454801 B1	U	20020924	9	Primary and
27	US 20020116061	U	20020822	63	Materials f
28	US 20020116059	U	20020822	64	Translation
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31	US 20020116056	U	20020815	65	Distending
32	US 20020101564	U	20020801	28	Artificial
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(12) **United States Patent**  
Glick et al.

(19) Patent No.: **US 6,616,692 B1**  
(45) Date of Patent: **Sep. 9, 2003**

(54) **INTRAOCULAR LENS COMBINATIONS**

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(75) Inventors: Robert E. Glick, Lake Forest, CA  
(US); Daniel G. Brady, San Juan Capistrano, CA (US)

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(73) Assignee: Advanced Medical Optics, Inc., Santa Ana, CA (US)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: 09/398,388  
(22) Filed: Sep. 3, 1999

**Related U.S. Application Data**

(60) Provisional application No. 60/132,085, filed on Apr. 30, 1999.  
(51) Int. Cl. A61P 2/16  
(52) U.S. Cl. 623/6.34; 623/6.37  
(58) Field of Search 623/6.34, 6.37, FOR 105

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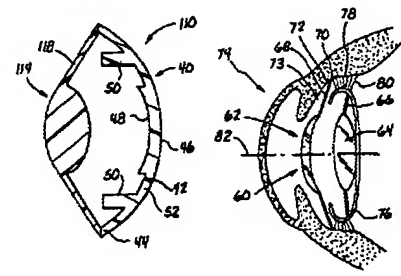
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Primary Examiner—David H. Willis  
(74) Attorney, Agent, or Firm—Scott, Uza, Buyan & Mullins, LLP; Frank J. Uza; Peter Jon Glick

**(37) ABSTRACT**

Intraocular lens combinations are provided which include a first optic having a negative optical power and being adapted to be placed in a substantially fixed position in a mammalian eye. A second optic having a higher optical power than the first optic is provided. In addition, a movement assembly is provided which is coupled to the second optic and is adapted to cooperate with the eye to effect accommodating movement of the second optic in the eye. Very effective accommodation is provided with the present intraocular lens combination. The present combinations can be effectively positioned to effectively inhibit or reduce the risk of posterior capsular opacification (PCO).

24 Claims, 2 Drawing Sheets



3/19/04 Best art found, see attached  
copies



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# (12) **United States Patent** Weinschenk, III et al.

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(45) Date of Patent: **Jul. 29, 2003**

## (54) **INTRAOCULAR LENS WITH A TRANSLATIONAL ZONE**

(75) Inventors: Joseph I. Weinschenk, III, Ft. Worth, TX (US); Charles K. Liao, Irvine, CA (US); Masoud Ghazizadeh, Laguna Niguel, CA (US)  
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(\* Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(h) by 47 days.

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Primary Examiner—David H. Wilke  
(74) Attorney, Agent, or Firm—Grant, Uza, Boyan & Mullins LLP, Frank Uza; Peter Jon Gluck

(21) Appl. No.: 09/657,251  
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(65) Prior Publication Data  
(63) Related U.S. Application Data  
(60) Provisional application No. 60/154,745, filed on Sep. 17, 1999.  
(51) Int. Cl. A61F 2/16  
(52) U.S. Cl. 623/6.34; 623/6.37; 623/6.28  
(58) Field of Search 623/6.11, 5.13, 623/6.22, 6.24, 6.27-6.39, 5.43-6.44, FOR 105

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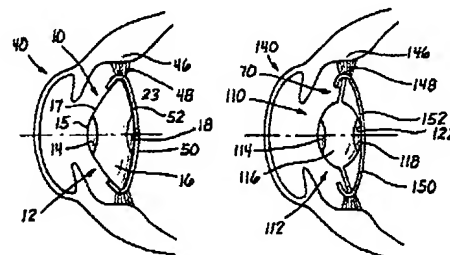
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## **ABSTRACT**

An intraocular lens (IOL) for use in a mammalian eye includes an optic adapted to focus light toward a retina of the mammalian eye and, in cooperation with the mammalian eye, to provide accommodation, the optic including a first portion adapted to move in response to the action of the mammalian eye; and a second portion secured to the first portion and having a higher index of refraction than the first portion and/or being positioned generally anterior of the first portion.

31 Claims, 2 Drawing Sheets



	Document ID	KS	Issue	Pat	Title
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12	US 20030130732	U	20030710	29	Haptics for
13	US 20030109925	U	20030612	10	Accommodati
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15	US 6554859 B1	U	20030429	18	Accommodati
16	US 6551354 B1	U	20030422	11	Accommodati
17	US 20030074061	U	20030417	89	Accommodati
18	US 20030074060	U	20030417	88	Method of p
19	US 20030060881	U	20030327	12	Intraocular
20	US 20030018384	U	20030123	20	Accommodati
21	US 20030004569	U	20030102	7	Lens implan
22	US 6488708 B2	U	20021203	16	Open chambe
23	US 20020161436	U	20021031	8	Primary and
24	US 6464725 B2	U	20021015	12	Two-lens ad
25	US 20020143395	U	20021003	11	Two-lens ad
26	US 6454801 B1	U	20020924	8	Primary and
27	US 20020116061	U	20020822	63	Materials f
28	US 20020116059	U	20020822	64	Translation
29	US 20020116058	U	20020822	64	Connection
30	US 20020116057	U	20020822	64	Optic confi
31	US 2002011678	U	20020815	65	Distending
32	US 20020101564	U	20020801	28	Artificial
33	US 6423094 B1	U	20020723	15	Accommodati
34	US 20020072795	U	20020613	13	Durable fle
35	US 6358280 B1	U	20020319	26	Artificial
36	US 20020002404	U	20020103	14	OPEN CHAMBE
37	US 6280471 B1	U	20010828	46	Glare-free
38	US 6277146 B1	U	20010821	28	Glare-free
39	US 20010012964	U	20010809	9	Accommodati
40	US 6231603 B1	U	20010515	10	Accommodati
41	US 6228113 B1	U	20010508	5	Intracornea
42	US 6197058 B1	U	20010306	15	Corrective
43	US 6197057 B1	U	20010306	21	Lens conver
44	US 6113633 A	U	20000905	8	Primary and
45	US 6066171 A	U	20000523	8	Intraocular
46	US 5968094 A	U	19991019	26	Compound in
47	US 5928283 A	U	19990727	7	Telescopic
48	US 5895422 A	U	19990420	11	Mixed optic
49	US 5876442 A	U	19990302	6	Intraocular
50	US 5824074 A	U	19981020	5	Intraoccula
51	US 5814103 A	U	19980929	7	Intraocular
52	US 5769890 A	U	19980623	9	Placement o
53	US 5410375 A	U	19950425		Multifocal
54	US 5391202 A	U	19950221		Intraocular
55	US 5358520 A	U	19941025		Supplementa
56	US 5354335 A	U	19941011		Intraocular

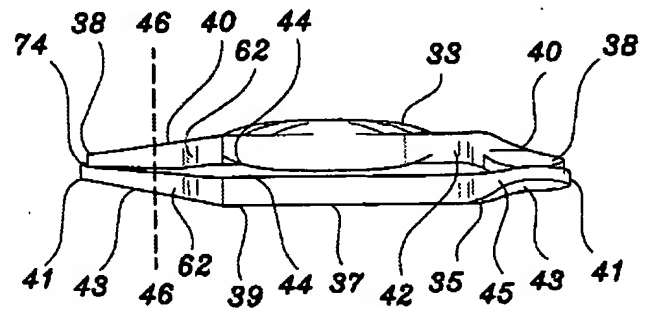


figure 3

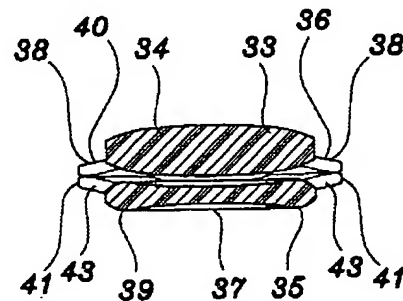


figure 4

	Document ID	KSo	Issue	Pa	Title
1	US 6695881 B2	U	20040224	13	Accommodati
2	US 20040034414	U	20040219	4	IOL Implant
3	US 20040015236	U	20040122	8	Sarfarazi e
4	US 20030204256	U	20031030	18	Accommodati
5	US 20030204255	U	20031030	18	Accommodati
6	US 20030204254	U	20031030	18	Accommodati
7	US 6638304 B2	U	20031028	19	Vision pros
8	US 20030187504	U	20031002	6	Adjustable
9	US 6616692 B1	U	20030909	11	Intraocular
10	US 6599317 B1	U	20030729	12	Intraocular
11	US 6596026 B1	U	20030722	7	Telescopic
12	US 20030130732	U	20030710	29	Haptics for
13	US 20030109925	U	20030612	10	Accommodati
14	US 6558420 B2	U	20030506	14	Durable fle
15	US 6554859 B1	U	20030429	18	Accommodati
16	US 6551354 B1	U	20030422	11	Accommodati
17	US 20030074061	U	20030417	89	Accommodati
18	US 20030074060	U	20030417	88	Method of p
19	US 20030060881	U	20030327	12	Intraocular
20	US 20030018384	U	20030123	20	Accommodati
21	US 20030004569	U	20030102	7	Lens implan
22	US 6488708 B2	U	20021203	16	Open chambe
23	US 20020161436	U	20021031	8	Primary and
24	US 6464725 B2	U	20021015	12	Two-lens ad
25	US 20020143395	U	20021003	11	Two-lens ad
26	US 6454801 B1	U	20020924	8	Primary and
27	US 20020116061	U	20020822	63	Materials f
28	US 20020116059	U	20020822	64	Translation
29	US 20020116058	U	20020822	64	Connection
30	US 20020116057	U	20020822	64	Optic confi
31	US 20020111678	U	20020815	65	Distending
32	US 20020101564	U	20020801	28	Artificial
33	US 6423094 B1	U	20020723	15	Accommodati
34	US 20020072795	U	20020613	13	Durable fle
35	US 6358280 B1	U	20020319	26	Artificial
36	US 20020002404	U	20020103	14	OPEN CHAMBE
37	US 6280471 B1	U	20010828	46	Glare-free
38	US 6277146 B1	U	20010821	28	Glare-free
39	US 20010012964	U	20010809	9	Accommodati
40	US 6231603 B1	U	20010515	10	Accommodati
41	US 6228113 B1	U	20010508	5	Intracornea
42	US 6197058 B1	U	20010306	15	Corrective
43	US 6197057 B1	U	20010306	21	Lens conver
44	US 6113633 A	U	20000905	8	Primary and
45	US 6066171 A	U	20000523	8	Intraocular
46	US 5968094 A	U	19991019	26	Compound in
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48	US 5895422 A	U	19990420	11	Mixed optic
49	US 5876442 A	U	19990302	6	Intraocular
50	US 5824074 A	U	19981020	5	Intraoccula
51	US 5814103 A	U	19980929	7	Intraocular
52	US 5769890 A	U	19980623	9	Placement o
53	US 5410375 A	U	19950425		Multifocal
54	US 5391202 A	U	19950221		Intraocular
55	US 5358520 A	U	19941025		Supplementa
56	US 5354335 A	U	19941011		Intraocular

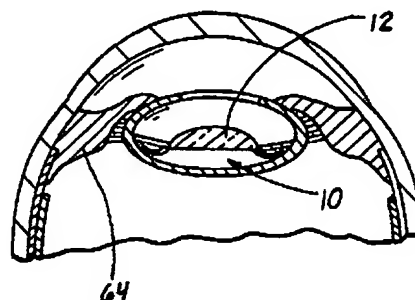
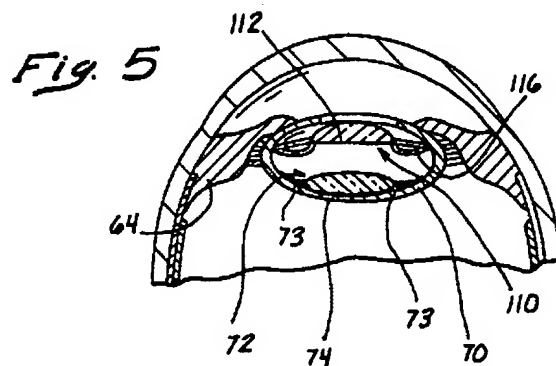


Fig. 4



	Document ID	Class	Issue Date	Page	Title
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4	US 20030204256	U	20031030	18	Accommodati
5	US 20030204255	U	20031030	18	Accommodati
6	US 20030204254	U	20031030	18	Accommodati
7	US 6638304 B2	U	20031028	19	Vision pros
8	US 20030187504	U	20031002	6	Adjustable
9	US 6616692 B1	U	20030909	11	Intraocular
10	US 6599317 B1	U	20030729	12	Intraocular
11	US 6596026 B1	U	20030722	7	Telescopic
12	US 20030130732	U	20030710	29	Haptics for
13	US 20030109925	U	20030612	10	Accommodati
14	US 6558420 B2	U	20030506	14	Durable fle
15	US 6554859 B1	U	20030429	18	Accommodati
16	US 6551354 B1	U	20030422	11	Accommodati
17	US 20030074061	U	20030417	89	Accommodati
18	US 20030074060	U	20030417	88	Method of p
19	US 20030060881	U	20030327	12	Intraocular
20	US 20030018384	U	20030123	20	Accommodati
21	US 20030004569	U	20030102	7	Lens implan
22	US 6488708 B2	U	20021203	16	Open chambe
23	US 20020161436	U	20021031	8	Primary and
24	US 6464725 B2	U	20021015	12	Two-lens ad
25	US 20020143395	U	20021003	11	Two-lens ad
26	US 6454801 B1	U	20020924	8	Primary and
27	US 20020116061	U	20020822	63	Materials f
28	US 20020116059	U	20020822	64	Translation
29	US 20020116058	U	20020822	64	Connection
30	US 20020116057	U	20020822	64	Optic confi
31	US 2002011678	U	20020815	65	Distending
32	US 20020101564	U	20020801	28	Artificial
33	US 6423094 B1	U	20020723	15	Accommodati
34	US 20020072795	U	20020613	13	Durable fle
35	US 6358280 B1	U	20020319	26	Artificial
36	US 20020002404	U	20020103	14	OPEN CHAMBE
37	US 6280471 B1	U	20010828	46	Glare-free
38	US 6277146 B1	U	20010821	28	Glare-free
39	US 20010012964	U	20010809	9	Accommodati
40	US 6231603 B1	U	20010515	10	Accommodati
41	US 6228113 B1	U	20010508	5	Intracornea
42	US 6197058 B1	U	20010306	15	Corrective
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44	US 6113633 A	U	20000905	8	Primary and
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46	US 5968094 A	U	19991019	26	Compound in
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53	US 5410375 A	U	19950425		Multifocal
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56	US 5354335 A	U	19941011		Intraocular

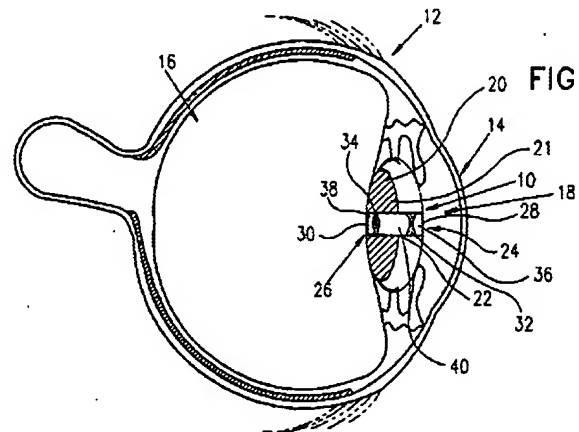


FIG. 1

	Document ID	Class	Pub. No.	Page	Title
1	US 20040054408	U	20040318	7	Accommodati
2	US 20040054407	U	20040318	11	Artificial
3	US 6702853 B1	U	20040309	11	Intraocular
4	US 20040039446	U	20040226	6	Accommodati
5	US 6695880 B1	U	20040224	4	Intraocular
6	US 6685741 B2	U	20040203	12	Intraocular
7	US 6666887 B1	U	20031223	11	Deformable
8	US 6660035 B1	U	20031209	13	Accommodati
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10	US 6645246 B1	U	20031111	11	Intraocular
11	US 6645245 B1	U	20031111	4	Accommodati
12	US 20030208265	U	20031106	27	Supplementa
13	US 20030204256	U	20031030	18	Accommodati
14	US 20030204255	U	20031030	18	Accommodati
15	US 20030204254	U	20031030	18	Accommodati
16	US 6638306 B2	U	20031028	20	Accommodati
17	US 6638305 B2	U	20031028	13	Monofocal
18	US 6638304 B2	U	20031028	19	Vision pros
19	US 20030199977	U	20031023	26	Accommodati
20	US 20030187505	U	20031002	17	Accommodati
21	US 20030187504	U	20031002	6	Adjustable
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23	US 20030171808	U	20030911	18	Accommodati
24	US 6616692 B1	U	20030909	11	Intraocular
25	US 20030158599	U	20030821	9	Accommodati
26	US 6599317 B1	U	20030729	12	Intraocular
27	US 20030135272	U	20030717	17	Accommodati
28	US 20030135271	U	20030717	7	In-vivo adj
29	US 6592621 B1	U	20030715	4	Flexible in
30	US 20030130732	U	20030710	29	Haptics for
31	US 20030125806	U	20030703	18	Binocular
32	US 6585768 B2	U	20030701	19	Intraocular
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34	US 20030109926	U	20030612	16	Accommodati
35	US 20030109925	U	20030612	10	Accommodati
36	US 6576012 B2	U	20030610	19	Binocular
37	US 6576011 B2	U	20030610	7	Multifocal
38	US 20030105522	U	20030605	26	Multi-focal
39	US 20030093150	U	20030515	19	Lenses capa
40	US 20030093149	U	20030515	29	Multi-focal
41	US 6557998 B2	U	20030506	11	Multifocal
42	US 20030083744	U	20030501	19	Intraocular
43	US 6554859 B1	U	20030429	18	Accommodati
44	US 20030078658	U	20030424	88	Single-piec
45	US 20030078657	U	20030424	88	Materials f
46	US 20030078656	U	20030424	88	Accommodati
47	US 6547822 B1	U	20030415	13	Ophthalmic
48	US 20030060881	U	20030327	12	Intraocular
49	US 6537317 B1	U	20030325	11	Binocular
50	US 6533813 B1	U	20030318	12	Intraocular
51	US 20030050696	U	20030313	6	Lens for in
52	US 20030050695	U	20030313	13	INTRAOCULAR
53	US 20030045931	U	20030306	13	Ophthalmic
54	US 6527389 B2	U	20030304	14	Multifocal
55	US 20030033013	U	20030213	44	Method of u
56	US 20030018384	U	20030123	20	Accommodati



US006616692B1

# (12) **United States Patent** Glick et al.

(10) Patent No.: **US 6,616,692 B1**  
(45) Date of Patent: **Sep. 9, 2003**

## (54) **INTRAOCULAR LENS COMBINATIONS**

(75) Inventors: Robert E. Glick, Lake Forest, CA  
(US); Daniel G. Brady, San Juan  
Capistrano, CA (US)

(73) Assignee: Advanced Medical Optics, Inc., Santa  
Ana, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/390,389

(22) Filed: Sep. 3, 1999

### Reprinted U.S. Application Data

(60) Provisional application No. 60/132,081, filed on Apr. 30,  
1999.

(51) Int. Cl. A61F 2/16

(52) U.S. Cl. 623/6.34; 623/6.37

(58) Field of Search 623/6.11, 6.22,  
6.23/6.34, 6.37, FOR 105

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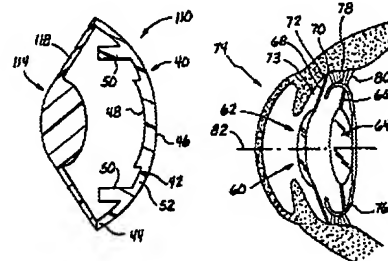
## **Primary Examiner—David H. Willie**

(74) Attorney, Agent, or Firm—Scout, Uza, Bayan &  
Mullins, LLP; Frank J. Uza; Peter Jon Gluck

## (57) **ABSTRACT**

Intraocular lens combinations are provided which include a  
first optic having a negative optical power and being adapted  
to be placed in a substantially fixed position in a mammalian  
eye. A second optic having a higher optical power than the  
first optic is provided. In addition, a movement assembly is  
provided which is coupled to the second optic and is adapted  
to cooperate with the eye to effect accommodating move-  
ment of the second optic in the eye. Very effective accom-  
modation is provided with the present intraocular lens  
combination. The present combinations can be effectively  
positioned to effectively inhibit or reduce the risk of poste-  
rior capsular opacification (PCO).

24 Claims, 2 Drawing Sheets



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US 20040054408	U	20040318	7	Accommodati
US 20040054407	U	20040318	11	Artificial
US 6702853 B1	U	20040309	11	Intraocular
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US 6695880 B1	U	20040224	4	Intraocular
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US 6666887 B1	U	20031223	11	Deformable
US 6660035 B1	U	20031209	13	Accommodati
US 20030210376	U	20031113	9	Ophthalmic
US 6645246 B1	U	20031111	11	Intraocular
US 6645245 B1	U	20031111	4	Accommodati
US 20030208265	U	20031106	27	Supplementa
US 20030204256	U	20031030	18	Accommodati
US 20030204255	U	20031030	18	Accommodati
US 20030204254	U	20031030	18	Accommodati
US 6638306 B2	U	20031028	20	Accommodati
US 6638305 B2	U	20031028	13	Monofocal
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US 20030018384	U	20030123	20	Accommodati



US006599317B1

# (12) **United States Patent** Weinschenk, III et al.

(10) Patent No.: **US 6,599,317 B1**  
(45) Date of Patent: **Jul. 29, 2003**

## (54) **INTRAOCULAR LENS WITH A TRANSLATIONAL ZONE**

(75) Inventors: Joseph I. Weinschenk, III, Ft. Worth, TX (US); Charles X. Liao, Irvine, CA (US); Masoud Charizadeh, Laguna Niguel, CA (US)

(73) Assignee: Advanced Medical Optics, Inc., Santa Ana, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(h) by 47 days.

(21) Appl. No.: 09/657,251

(22) Filed: Sep. 7, 2000

(65) Prior Publication Data

(68) Related U.S. Application Data

(60) Provisional application No. 60/154,745, filed on Sep. 17, 1999.

(51) Int. Cl. A61F 2/16

(52) U.S. Cl. 623/6.34; 623/6.37; 623/6.25

(58) Field of Search 623/6.11, 5.13, 623/6.22, 6.24, 6.27-6.39, 5.43-6.44, FOR 105

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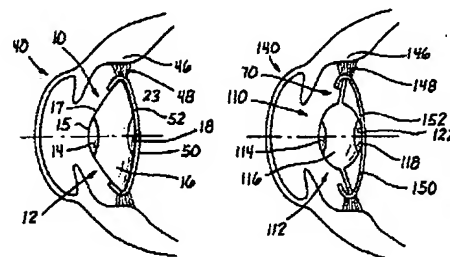
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## (57) **ABSTRACT**

An intraocular lens (IOL) for use in a mammalian eye includes an optic adapted to focus light toward a retina of the mammalian eye and, in cooperation with the mammalian eye, to provide accommodation, the optic including a first portion adapted to move in response to the action of the mammalian eye; and a second portion secured to the first portion and having a higher index of refraction than the first portion and/or being positioned generally anterior of the first portion.

31 Claims, 2 Drawing Sheets





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# (12) **United States Patent** Skotton

(10) Patent No.: **US 6,464,725 B2**  
(43) Date of Patent: **Oct. 15, 2002**

## (54) **TWO-LENS ADJUSTABLE INTRAOCULAR LENS SYSTEM**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(h) by 6 days.

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(51) Int. Cl.<sup>7</sup> **A61F 2/16**

(52) U.S. Cl. **623/6.34; 623/6.37; 623/6.33**

(58) Field of Search **623/6.34, 6.37, 6.33, 6.39, 6.32**

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### ABSTRACT

A lens system for implantation in a human eye which makes it possible to restore accommodation. The lens system comprises one anterior lens (2) and a posterior lens (4), out of these two lenses one has positive and the other has negative lens power. Accommodation is achieved by varying the distance between the two lenses. This lens system can be made so as to generate large changes in optical power for small changes in position. It also allows the amount of change in optical power for any given amount of change in distance between the lenses to be selected relatively independently of the optical power of the overall lens system.

9 Claims, 5 Drawing Sheets

